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Case Letter

Chronic granulomatous infection of the foot mimicking mycetoma: A diagnostic and therapeutic challenge

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Sir,

Chronic granulomatous foot infections, marked by nodules, discharging sinuses, and tissue damage, may mimic mycetoma. Accurate differentiation between bacterial, fungal, and mycobacterial causes is crucial. This case highlights the importance of comprehensive clinical, microbiological, and histopathological evaluation in achieving a correct diagnosis and effective treatment.

A 49-year-old male presented with complaints of swelling on the right foot persisting for five years. The patient recalled a penetrating injury to a nail ten years ago, following which he noticed a 1 × 1 cm raised lesion on the sole of the right foot. Over time, the lesion enlarged, became painful, and was associated with yellow crusting and pus discharge. Over the subsequent years, he experienced recurrent episodes of swelling and sought various medical treatments with no lasting improvement. At the time of presentation, the swelling had become ill-defined and extended to approximately 15 × 15 cm, with multiple erythematous nodules, ulcers, crusting, and discharging sinuses (Figs. 1a and 1b). Notably, the patient was pain-free at the time of admission with significant deformity of the foot and difficulty in walking. He did not have any comorbidities such as diabetes mellitus, hypertension, asthma, or tuberculosis.

On local examination of the foot, diffuse swelling with multiple discharging sinuses with crusting, ulcers, and puckered scars was noted on the plantar surface of the foot. Gross examination of the seropurulent discharge and sinuses revealed white granules.

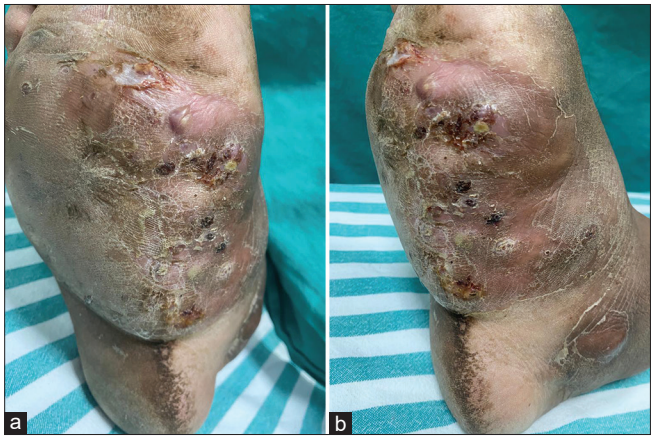

Figure 1: (a) The patient's foot at the time of admission showing diffuse swelling with multiple discharging sinuses with crusting, ulcers, and puckered scars noted over the plantar aspect of the foot. (b) Lateral view of the foot at the time of admission.

On palpation, a local rise of temperature was noted not associated with tenderness. The regional lymph nodes were not enlarged. The patient's clinical history and physical examination were highly suggestive of mycetoma.

For the confirmation of diagnosis, granules could not be elicited, and Gram-stained smear from the discharging sinuses and from the ulcer showed Gram-positive fine thread-like branching bacteria. Acid-fast bacilli stain was negative, and pus culture showed *Staphylococcus aureus* resistant to ampicillin, ciprofloxacin, penicillin G. FNAC showed mixed inflammatory cells, squamous

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epithelial cells, hemorrhage, no fungal elements. HIV, HBsAg, VDRL: non-reactive. An X-ray of the foot showed no bone abnormalities (Fig. 2). Soft tissue scan: multiple communicating cystic lesions with internal echoes, sinus tracts, and abscesses in subcutaneous and intramuscular planes, suggestive of a chronic infection.

Histopathology revealed a hyperkeratotic, stratified, squamous epithelium with dense dermal fibrosis and granulation tissue consistent with chronic granulomatous inflammation (Figs. 3a and 3b). All these findings were suggestive of a chronic granulomatous infection of the foot, likely with a bacterial etiology, resembling actinomycetoma, without definitive fungal or mycobacterial evidence.

The patient had visited multiple doctors and undergone multiple therapies and gave a history of previous treatment with antifungals with no clinical response. As the clinical presentation and investigations were suggestive of a bacterial infection and the patient was resistant to penicillin, we decided on the final treatment with a modified Welsch regimen. Intensive phase: Injection of Amikacin 15 mg/kg/day IV every 12 hours for 21 days per cycle, total of 6 cycles, each separated by 15-day intervals. Maintenance phase: Tab. Cotrimoxazole 35 mg/kg/day Cap. Rifampicin 10 mg/kg/day continued for 3 months after the last amikacin cycle was advised. After six months of treatment, the lesions healed with minimal scarring and a complete resolution of the deformity (Figs. 4a and 4b).

Figure 2: X-ray of the right foot showing no bone involvement.

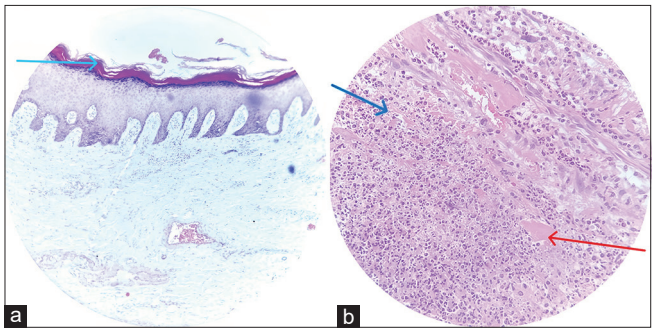

Figure 3: (a) Hyperkeratotic stratified sq epithelium (*blue arrow*) (H&E, 10x).(b) Deeper dermis showing mixed inflammatory infiltrate (*blue arrow*) with foci of granulation tissue (red arrow) (H&E, 40x).

Mycetoma is a chronic granulomatous disease of the skin and subcutaneous tissues with a triad of soft tissue swelling, nodules with discharging sinuses, and extrusion of grains.

Mycetoma is broadly categorized into two subtypes: eumycetoma (fungal) and actinomycetoma (bacterial), depending on the causative organisms. Usually, the infection is preceded by a trauma to the feet, especially in people walking barefoot, those engaged in farming or nomads. The lesion initiates as a small, painless, subcutaneous nodule that becomes multiple, ulcerated, and drained via the sinus tracts [1,2].

Discharge from these tracts often contains characteristic granules. Skin biopsies and microbiological culture identify the organism. White, yellow, or red grains are found in bacterial (actinomycetoma) and black or white grains in fungal (eumycetoma) infections [3,4].

Bacterial infections progress faster than eumycetoma, which typically causes localized swelling and sinus tracts. Diagnosis relies on clinical features, histopathology, and grain microscopy. Mycetoma must be distinguished from conditions such as cutaneous TB, osteomyelitis, actinomycosis, and others. Multidrug therapy is preferred over monotherapy. Key treatment regimens include the following. Two-step

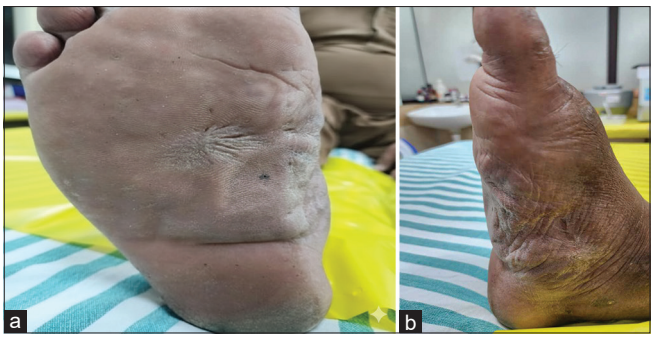

Figure 4: (a) Completely healed leg with minimal scarring after six months of treatment.(b) Lateral view of the foot post treatment.

regimen: Penicillin, gentamycin, and cotrimoxazole for 5–7 weeks, followed by amoxicillin and cotrimoxazole until 2–5 months post-cure. Modified two-step: Gentamycin IV + cotrimoxazole orally for 4 weeks, then maintenance with cotrimoxazole and doxycycline for 6 months after cure. Welsh regimen: Cycles of IV amikacin + cotrimoxazole for 21 days, alternating with cotrimoxazole alone for 15 days, repeated 3–4 times, then maintenance [4-6]. Modified Welsh: Adds rifampicin to the Welsh regimen. For uncomplicated actinomycetoma, trimethoprim-sulfamethoxazole is used for 6 months to 2 years. Alternatives include amoxicillin-clavulanic acid or doxycycline. Chronic granulomatous foot infections may mimic mycetoma [7,8]. In this case, despite negative fungal/AFB stains, imaging and histology indicated granulomatous infection. Culture confirmed *S. aureus*, and the modified Welsh regimen led to successful treatment, highlighting the importance of prolonged targeted antibiotic therapy.

Chronic granulomatous foot infections resembling mycetoma require a multidisciplinary, targeted approach. This case underscores the importance of repeat cultures, histopathology, and empirical multidrug therapy in managing refractory cases [9,10].

Consent

The examination of the patient was conducted according to the principles of the Declaration of Helsinki.

The authors certify that they have obtained all appropriate patient consent forms, in which the patients gave their consent for images and other clinical information to be included in the journal. The patients understand that their names and initials will not be published and due effort will be made to conceal their identity, but that anonymity cannot be guaranteed.

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